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Menu planning, energy density intake, food leftovers and nutritional status among elderly at nursing home

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ABSTRAK

***Latar Belakang**: Hal terpenting dalam pemberian makanan kepada lansia adalah makanan yang disajikan harus memenuhi kebutuhan gizinya, makanan yang disajikan diberikan secara teratur dalam porsi kecil namun sering, makanan tersebut harus bertahap dan bervariasi agar tidak menimbulkan kebosanan. Makanan harus sesuai petunjuk dokter untuk lansia tertentu dan makanan harus empuk. Lansia yang tinggal di Panti Jompo dihadapkan pada situasi yang berbeda dari sebelumnya tinggal di Panti Jompo. Hal tersebut menyebabkan para lansia melakukan penyesuaian agar kebutuhannya dapat terpenuhi. Kondisi kesehatan pada tahap lanjut usia sangat ditentukan oleh kualitas dan kuantitas asupan gizinya.*
***Tujuan**: Penelitian ini bertujuan untuk mengetahui analisis perencanaan menu, hubungan kepadatan konsumsi energi dan sisa makanan dengan status gizi lansia di Panti Jompo.*
***Metode**: Penelitian ini merupakan penelitian observasional dengan desain penelitian cross-sectional. Pengambilan sampel dilakukan dengan teknik purposive sampling dengan jumlah responden sebanyak 50 lansia. Analisis bivariat menggunakan uji statistik Chi-Square.*
***Hasil**: Perencanaan menu di Panti Jompo dilakukan setahun sekali dengan siklus menu tujuh hari yang disusun oleh Ahli Gizi Puskesmas dan memiliki struktur menu yang terdiri dari frekuensi pemberian makan 3 kali makan utama dan 2 selingan. Aplikasi dalam memberi makan belum disesuaikan dengan menu yang dibuat oleh Ahli Gizi. Sebagian besar responden berusia 60-74 tahun (lansia). Hasil uji korelasi menunjukkan bahwa tidak ada hubungan antara kepadatan konsumsi energi dengan status gizi lansia (p = 0,589) (p> 0,05) dan ada hubungan antara sisa makanan dengan status gizi lansia (p = 0,010). (p <0,05).*
***Kesimpulan:** Beberapa perencanaan menu di panti sudah dilaksanakan dan beberapa tidak memenuhi faktor-faktor yang mempengaruhi perencanaan menu di panti. Ada hubungan antara sisa makanan dengan status gizi lansia, faktor utama yang mempengaruhi status gizi adalah asupan makanan. Hal ini tidak hanya karena sedikitnya sisa makanan (<20%) yang menyebabkan risiko gizi buruk, tetapi ada faktor lain berdasarkan pertanyaan dan hasil skor MNA.*

KATA KUNCI*: lansia; perencanaan menu; densitas energi konsumsi; sisa makanan*

ABSTRACT

***Background:** The most important thing in giving food to the elderly is that the food served must meet the nutritional needs, the food served is given regularly in small portions but often, the food must be gradual and varied so as not to cause boredom, the food must be according to doctor's instructions for certain elderly and food must be soft. The elderly who live in the Werdha Nursing Home are faced with a different situation than before they lived in an orphanage. This causes the elderly to make adjustments so that their needs can be fulfilled. Health conditions in the elderly stage are largely determined by the quality and quantity of nutritional intake.*
***Objective:** This study aims to determine the analysis of menu planning, the relationship of energy consumption density and food waste to the nutritional status of the elderly at the Nursing Home*
***Method:** This study was an observational study of cross-sectional study design. Sampling was done*

by purposive sampling technique with a total of 50 elderly respondents. Bivariate analysis using Chi-Square statistical tests.

Results: *Planning the menu at the Nursing Home is carried out once a year with a seven-day menu cycle compiled by a Puskesmas Nutritionist and has a menu structure consisting of the frequency of feeding 3 main meals and 2 interludes. The application in feeding has not been adjusted to the menu made by a Nutritionist. Most respondents were aged 60-74 years (elderly). Correlation test results showed that there was no relationship between energy consumption density with the nutritional status of the elderly (p = 0.589) (p> 0.05) and there was a relationship between food waste and the nutritional status of the elderly (p = 0.010) (p <0.05).*

Conclusion: *Some menu planning at the Social Institution was carried out and some did not meet the factors that influence menu planning at the institution. There is a relationship between food waste with the nutritional status of the elderly, the main factor affecting nutritional status is food intake. This is not only because of the small amount of food left (<20%) which causes the risk of malnutrition, but there are other factors based on the questions and the results of the MNA score.*

KEYWORDS *: elderly; menu planning; energy density consumption; leftovers*

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INTRODUCTION

Adequacy of healthy food is very important for the elderly. People aged 70 years, nutritional needs are the same as when they were 50 years old, but their appetite tends to continue to decline, because it must continue to be pursued for the consumption of nutritious foods (1). Changes in nutritional needs and intake must be anticipated by proper feeding so that it does not cause nutritional problems or worsen the physical condition of the elderly.

Found the percentage of elderly people in Indonesia who live in urban areas suffering from undernourishment by 3.4%, 28.3% less weight, overweight 6.7%, obese 3, 4% and 42.4% of ideal body weight. Based on these data nutritional problems that often occur in the elderly are malnourished and underweight (2). Some data shows that more than 28% of elderly people living in Orphanage in Jakarta have a below-normal Body Mass Index (BMI) (3).

Ineffectiveness in choosing foods combined with weak absorption of the digestive tract, triggering a lack of vitamins and minerals that will affect the health condition and nutritional status of the elderly (4). Health conditions in the elderly stage are largely determined by the quality and quantity of nutritional intake. Good nutrition will play a role in efforts to reduce the percentage of disease and the mortality rate of the elderly.The elderly who live in the Werdha Nursing Home are faced with a different situation than before they lived in an orphanage. This causes the elderly to make adjustments so that their needs can be fulfilled. Even though the elderly have received attention related to health by the institution, but the health problems of the elderly cannot be avoided, including nutritional problems (5). Nutritional status and health status are largely determined by conditions experienced by the elderly. Nutritional status and good health status will bring someone to healthy and productive longevity. In addition, the health status of the elderly will influence the assessment of nutritional needs (4).

By improving nutrition services in the elderly it is hoped that it can overcome the problems of elderly nutrition so that in the end it can improve the nutritional status and health of the elderly.

This study aims to determine the analysis of the planning menu of the relationship between energy consumption density and food waste with the nutritional status of the elderly at PSTW Budi Mulia 4 Cengkareng.

MATERIALS AND METHODS

This research was an observational study with an analytic cross-sectional study design to analyze menu planning and identify the relationship of energy consumption density and food waste to the nutritional status of the elderly in Orphanage Budi Mulia 4 Cengkareng. The study was conducted at OrphanageBudi Mulia 4 Cengkareng, West Jakarta in October-November 2019.

The number of respondents in this study was 50 elderly. Sampling was done by using the technique of *purposive sampling* by taking into account the criteria inclusion-exclusion. Subjects who took part in this study had fulfilled the inclusion criteria that were willing to become respondents by signing informed consent, aged 4 5 -90 years, were in the orphanage and consumed orphanage food, healthy body condition and were independent in their daily activities. Exclusion criteria are the elderly who live in an isolated house and have mental disorders and bedrest.

Using instrumentsquestionnaire contains the identity of respondents (gender, age, and length of stay in an institution), the results of measurements of nutritional status based on form *The Mini Nutritional Assessment (* MNA) and the data density of energy consumption as well as the leftoveris based on the form of food weighing. Planning for a menu based on observations and interviews with officials who organizee the food at nursing home using form threads with questions about the cycle of the menu, menu structure, menu planning or budget.

Univariate analysis was performed to describe each variable. The bivariate analysis was conducted to analyze the relationship between significant and insignificant density energy consumption and food leftovers and nutritional status of the elderly by using the test *of chi-square* with a 95% confidence level (α = 0.05).

This study was approved by the Esa Unggul University Health Research Ethics Committee number: 0477-19.468 / DPKE- KEP / FINAL EA / UEU / IX / 2019.

RESULTS

Overview stats n menu in PSTW Budi Mulia

Planning for menu and meal planning in PSTW Budi Mulia 4 Cengkareng performed by nursing personnel in cooperation with Dietician from health Cengkareng Jakarta Province. Menu planning at PSTW Budi Mulia 4 Cengkareng is done once a year by the Cengkareng Health Center Nutritionist who was previously discussed and approved by the head of the orphanage by adjusting the budget.

Cycle menu used in PSTW Budi Mulia 4 is a seven-day cycle menu that has a menu structure consisting of the frequency of feeding 3 times a main meal and 2 snacks throughout the day. The menu in PSTW Budi Mulia 4 has considered several factors that influence menu planning, consumer and management factors, can be seen in **Table 1,** as follows:

Table 1. Menu Planning Factors at PSTW Budi Mulia 4 Cengkareng

Menu Planning Factors	Application	
	Fulfill	Does not meet the
Consumer Factors:		
- Nutritional Needs	1	0
- Food Habit & Preference	0	1
- Characteristics of Foodstuffs	0	1
Management Factor		
- Institutional Objectives		
- Funds or Budget	1	0
- Availability of foodstuffs	1	0
in the market	0	1
- Physical facilities and equipment	0	1
- Staff Skills and Service Systems	1	0
Total Deployment	4	4
% Application	50 %	50 %

The table above illustrates that menu planning in PSTW Budi Mulia has considered several factors that influence menu planning according to consumer factors including nutritional adequacy as seen from the menu cycle created by the Primary Health Service Nutritionist, while based on management factors that have met that is from institutional goals indicated by the availability of the cycle menu

according to the existing service classification, funds or budget are provided from the DKI Jakarta social services for the food supply budget every day.

Budget planning at the Orphanagespent approximately Rp. 300,00 0,000 / month for 250 people. Determination of food prices for each day is not explained in detail but the price determined for each day is Rp 40,000, - / person. So for spending everyday shopping that is Rp. 10,000,000 per day for 250 people. Factors that have not been considered are the availability of food ingredients in the market and food habits and preferences that are still not good, the characteristics of foodstuffs are still lacking in view of observations of cooked food ingredients such as eggs that are incompatible with the characteristics of foodstuffs, as well as physical facilities and equipment for example when observing visible food containers or comparing to put elderly food that has been damaged and needs to be replaced. Some other aspects have not yet been fulfilled, such as paying attention to the availability of ingredients on the market, evaluating the menu and nutritional needs of the elderly which are taken into account but are still lacking in attention and application.

The number of permanent cooks at Orphanage is 3 female cooks and assisted by 3 kitchen pantry managers namely men. Cooking activities are carried out 3 times/day for 3 meals, namely for breakfast, lunch and evening because the menu that is served varies from breakfast, lunch and evening. The portion of food is determined by the kitchen staff according to the specified portion but it turns out at the time of the elderly researchers there are still asking to add food. The standard recipe used is obtained from recipes that already exist but are developed by nutritionists so that according to the characteristics of consumers served. These prescription standards have not been well documented or written recipe standards for food do not yet exist, nor are standard servings.

Existing menu cycles are not implemented properly, as in the menu cycle there are fruits and snacks, but when observing the fruit provided does not match those contained in the menu and sometimes there is not always a snack that is served. This is because it is related to not paying attention to the procurement of food ingredients.

The institution conducts a menu cycle according to the day of the week or seven days. Judging from the menu cycles that are displayed there are still a frequent repetition of the use of food ingredients, besides that variations in food ingredients are also still lacking in attention, so that often the same food ingredients used at close proximity only are distinguished in variations in processing or cooking techniques. Variations in food ingredients on the menu observation results from the menu cycle are quite varied from food sources of carbohydrates, animal vegetable protein, vegetables and fruit are complete. However, inside dishes of animal and vegetable protein sources such as eggs that are served at breakfast time are served again at lunch, as well as vegetable protein such as tempeh and tofu served again at lunchtime it's just a way of processing and recipes of food that is different.

Description of the characteristic of research respondents

The number of respondents in this study was 50 elderly composed of 46% male and 54 % female. Based on age, the highest number of respondents was found in the age group of 60-74 years (elderly) as many as 32 respondents (64%) with the lowest age of 50 years and the highest age of 76 years. Respondents who lived in PSTW Budi Mulia most stayed for ≥ 1-6 years, namely 39 respondents (78%).

Table 2. Characteristics of Research Respondents

Characteristics of Respondents	Amount	
	n	%
Age		
45 - 59 *(Middle Age)*	16	32
60 - 74 *(Elderly)*	32	64
75 - 90 *(Old)*	2	4
Gender		
Male	23	46
Female	27	54
Long stay at the orphanage		
<1 Year	11	22
≥ 1 Year	39	78

Overview of Energy Consumption Density, Food Time and Nutritional Status of the Elderly

Table 3 shows by sex the energy consumption density is divided into low, medium and high categories. Based on the density of energy consumption in men shows that dominated by respondents in the low category as many as 22 respondents (95.7%). Likewise with the energy consumption density in women dominated in the low category of 25 respondents (92,6%).

The distribution of leftovers in the <20% category was 48 respondents (96%) and for the ≥20% category only 2 respondents (4%). Almost all respondents who left food scraps <20%. The calculation of nutritional status based on MNA scores shows that most respondents in the category of malnutrition risk are 29 respondents (58%)

DISCUSSION

Analysis of Menu Planning at PSTW Budi Mulia 4 Cengkareng

Menu planning in one cycle consists of activities to compile menu patterns, menu guidelines, master menus, inserting dishes in the master menu to evaluate the menus. This activity is very important in the food management system because the menu is closely related to the needs and use of other resources in the system such as the budget, menu planning must be adjusted to the existing budget by considering nutritional needs and aspects of food density and variations in food ingredients.

A balanced menu is necessary for health, but so that the menu provided can be finished, it is necessary to arrange good menu variations, aspects of composition, color, taste, appearance, and a combination of matching dishes (6).

The first food processing process you do is menu planning. Food delivery activities at PSTW Budi Mulia 4 Cengkareng began with menu planning activities. Based on the results of research on menu planning and menu preparation at Orphanage Budi Mulia 4, it was conducted by an orphanage officer in collaboration with Nutritionists from Cengkareng Health Center, DKI Jakarta Province.

Menu planning at PSTW Budi Mulia 4 Cengkareng is done once a year by the Primary Health Service Nutritionist who was previously

Table 3. Distribution of Energy Consumption Density, Food Leftovers & Nutritional Status of the Elderly

Variable		Category	n	%
Energy Density Consumption	Male	Low (<1.53)	22	95.7 %
		Medium (1.53-2.08)	1	4.3 %
		Hight(≥2.09)	0	0
	Female	Low (<1.45)	25	92.6 %
		Medium (1.45-1.98)	2	7.4 %
		High (≥1.99)	0	0
Leftovers		Lots (≥20%)	2	4%
		Little (<20%)	48	96%
Nutritional status		Good> 24	14	28%
		Less Risk 17-24	29	58%
		Less <17	7	14%

Table 4. Energy density, Food Leftover and nutritional status among elderly

Energy Density Consumption	Category	Nutritional status						Total		*P-value*
		Malnutrition		Risk of Malnutrition		Normal Nutrition				
		n	%	n	%	n	%	n	%	
	Is	0	0	2	66.7	1	33.3	3	100	0.589
	Low	7	14.9	27	57.4	13	27.7	47	100	
Leftovers	≥20%	2	100	0	0	14		2	100	0.010
	<20%	5	10.4	29	60.4		29.2	48	100	
	Total	**7**	**14**	**29**	**58**	**14**	**28**	**50**		

discussed and approved by the head of the orphanage. The menu cycle used at PSTW Budi Mulia 4 Cengkareng is a seven-day menu cycle that has a menu structure consisting of the frequency of feeding 3 times a day and 2 times a day snack.

The menu at PSTW Budi Mulia 4 has considered several factors, including equipment and the amount of labor available, the availability of food in the market, nutritional needs and the budget provided.

The seven-day menu cycle will make it difficult in turnover especially on the dates of the next month, different from the 10-day menu cycle plus a special day which makes it easy at the turn of the next month, was at the beginning of the monththe first day will use the first menu cycle and the next day will use the day cycle next. Besides, the seven-day menu cycle is faster in repetition of the menu compared to the ten-day cycle so that it can cause boredom (7). The advantages are the repetition of food and dishes takes longer but the shortcomings of consumers are easy to remember because they relate to the name according to the day (8).

The Relationship of Energy Consumption Density to the Nutrition Status of the Elderly

Bivariate analysis of variables is known to use the chi-square test conducted on respondents totaling 50 elderly to see the relationship between nutritional status and energy density of consumption.

The results of the study in the table above if the p-*value* > 0.05 then H0 is accepted and vice versa if the p-*value* <0.05 then H0 is rejected. The results obtained in the table above are p-value = 0.589 (p> 0.05), so H0 fails to be rejected because the p-value is 0.589> 0.05, which means there is no relationship between energy consumption density and nutritional status of the elderly in PSTW Budi Mulia 4 Cengkareng. This indicates that respondents who have a low energy consumption density value are not having a lack of nutritional status because there is no significant difference in the energy density consumed.

This study is in line with what was done by Ekaningrum *et al*. that there was no correlation between energy density and nutritional status (p = 0.607) because there was no significant difference in the energy density consumed.(9)

Foods with low energy density can reduce total energy intake Maillot *et al*.diet quality, and diet cost for 1332 adult participants in the French National INCA1 Study. Nutrient profiles were based on the presence of 23 qualifying nutrients, expressed as the percentage of nutrient adequacy per 8 MJ, and 3 negative or disqualifying nutrients, expressed as the percentage of the maximal recommended values for saturated fatty acids, added sugar, and sodium per 1.4 kg. Calculated cost of energy (€/8 MJ in addition, it can control hunger and quickly provide a sense of fullness (10,11)diet quality, and diet cost for 1332 adult participants in the French National INCA1 Study. Nutrient profiles were based on the presence of 23 qualifying nutrients, expressed as the percentage of nutrient adequacy per 8 MJ, and 3 negative or disqualifying nutrients, expressed as the percentage of the maximal recommended values for saturated fatty acids, added sugar, and sodium per 1.4 kg. Calculated cost of energy (€/8 MJ. Foods that have a high energy density tend to have palatability (increase appetite) so that it is preferred by many people. Foods with low energy density have satiety (reduce hunger). This is due to the gastric emptying process that takes longer to consume foods with low energy density (12).

Relationship of food leftover with nutritional status in the elderly

Based on the *chi-square* statistical test between leftovers and nutritional status in the elderly, a significantvalue of p = 0.010 (p <α) showed that there was a relationship between leftovers and nutritional status in the elderly.

This indicates that respondents who died of leftovers with little food <20% had good nutritional status and respondents who had lots of leftovers> 20% had undernourished or under-risk status.

Based on these results, more elderly people are at risk of malnutrition compared to elderly people who are malnourished or elderly who have good nutrition. This is not only because of the small amount of food left (<20%) which causes the risk of malnutrition, but there are other factors

based on the questions and the results of the MNA score. This is the same as Guigoz›s literature on the use of MNA for elderly people living in nursing homes conducted in 32 studies (n = 6821), where there are more elderly people who are at risk of malnutrition compared to older people who have malnutrition problems and elderly people who have good nutrition. This is consistent with the theory that the main factor influencing nutritional status is food intake (13).

Several factors can influence a person to experience the possibility of malnutrition in the questions in the MNA. These factors include a decrease in food intake over the past 3 months, weight loss, mobilization, psychological stress or acute illness, neuropsychological problems and the results of calculating BMI.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results of menu planning and menu preparation at PSTW Budi Mulia 4 Cengkareng, it was conducted by an orphanage officer in collaboration with Nutritionists from Cengkareng Health Center, DKI Jakarta Province. Menu planning at PSTW Budi Mulia 4 Cengkareng is done once a year by the Cengkareng Health Center Nutritionist who was previously discussed and approved by the head of the orphanage.

The menu cycle used at Orphanage Budi Mulia 4 is a seven-day menu cycle that has a menu structure consisting of the frequency of feeding 3 times a day and 2 times a day snack. The menu at Orphanage Budi Mulia 4 has considered several factors, including equipment and the amount of labor available, the availability of food in the market, nutritional needs and the budget provided.Most of the elderly have under-risk nutritional status where it has a negative impact considering the elderly group is a vulnerable group. The results of bivariate analysis and the relationship between food waste and nutritional status in the elderly.

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